FOREST SERVICE - U. S. DEPARTMENT OF AGRICULTURE

PACIFIC SOUTHWEST
FOREST AND RANGE
EXPERIMENT STATION
BERKELEY - CALIFORNIA

# RESEARCH NOTE

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## CALIFORNIA CONE CROP--1959

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Only a few localities in California can expect a good crop of forest tree seed in 1959. In general, field reports indicate that the cone crop on commercial forest trees will be even lower this year than in 1958. Only 14 percent of the reports rated the potential crop as medium or heavier, compared to 23 percent last year. Even in the seed zones having good prospects, the crop will vary considerably in different parts and will generally be restricted to small areas. Heavy crops were indicated for ponderosa pine in zones I, II, and III; for Jeffrey pine in zones IV, V, and VI; for sugar pine in zones IV and V; for California red fir in zones V, VII, and VIII; for Douglas-fir in zones X, XI and XII; and for redwood in zone XII.

These are the main conclusions from a study of the cone-crop reports sent to the Pacific Southwest Forest and Range Experiment Station by members of the California Division of Forestry, the California Region of the U. S. Forest Service, the Southern California Edison Company, the Department of Forestry of Humboldt County, and members of the Experiment Station.

Most of the reports were based on ocular estimates in which the crop was rated as none, very light, light, medium, or heavy, according to the cone crop classification used in Oregon 1/. In this classification the cone crop ratings are:

1. None--no cones on any trees or few cones on occasional trees.

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1/ Engstrom, W. H. Oregon cone crop, 1954. Oregon State Board of Forestry. Res. Note 16, 7 pp., 1954.

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2. Very light--few cones on 25 percent of the trees, or few cones on 25 percent of the trees and many cones on occasional trees.

3. Light--few cones on 75 percent of the trees, or many cones on some trees and few cones on 75 percent of the trees.

4. Medium--some cones on all trees, or many cones on less than 75 percent of the trees.

5. Heavy--many cones on 75 percent of the trees and some cones on all trees, or many cones on all trees.

Although these ratings are subjective, they provide valuable information for those planning to collect seed this fall.

Several of the cone crops in seed zones IV and V were rated by the cone crop index devised by Fowells and Schubert. 2/ This index contains 5 classes of crops based on the average number of cones per tree larger than 19.5 inches in diameter:

| Cone crop rating: | Ponderosa pine | Sugar pine or white fir |
|---|---|---|
| None | 0 | 0 |
| Light | 1-20 | 1-10 |
| Medium | 21-80 | 11-40 |
| Heavy | 81-160 | 41-80 |
| Very heavy | 161 or more | 81 or more |

As an aid to seed collectors the crop reports have been segregated according to the forest tree seed collection zones described by Fowells. 3/ This grouping (table 1), shows that the most promising localities for collecting seed of major commercial conifers--those with medium to heavy cone crops--are as follows:

| Species | Seed zones |
|---|---|
| Douglas-fir | II, X, XI, and XII |
| California red fir | V, VII, and VIII |
| White fir | XI |
| Lowland white fir | XI and XII |
| Jeffrey pine | I, IV, V, VI, and VIII |
| Knobcone pine | I and III |
| Ponderosa pine | I, II, III, and X |
| Sugar pine | III, IV, V, X, and XIII |
| Redwood | XI, XII, and XIII |

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2/ Fowells, H. A. and Schubert, G. H. Seed crops of forest trees in the pine region of California. U. S. Dept. Agr. Tech. Bull. 1150, 48 pp., illus., 1956.

3/ Fowells, H. A. Forest tree seed collection zones in California. U. S. Forest Serv. Calif. Forest and Range Expt. Sta. Forest Res. Note 51, 5 pp., illus. 1946.

Considerable activity of cone and seed insects has been observed this year in Douglas-fir, ponderosa pine, and sugar pine which will reduce the crop in many areas. Squirrels and birds can also be expected to reduce further the cone crop, particularly for the pines, because of the low level of other available food this year.

A map of the collection zones is appended to this note, but since the seed crop is spotty and varies widely in most zones, it is also advisable to consult field offices of the California Division of Forestry, Department of Forestry of Humboldt County, or the U. S. Forest Service to determine best areas to collect cones.

Table 1. --Summary of cone crops by species and seed zone, California, 1959

| Species | Seed zone | Cone crop 1/ |
|---|---|---|
| CEDAR: | | |
| Incense-cedar (Libocedrus decurrens) | VIII | None |
| | II, III, VII | None to very light |
| | IV, V | None to light |
| | I | Very light |
| | IX, X | Very light to light |
| DOUGLAS-FIR: | | |
| Bigcone Douglas-fir (Pseudotsuga macrocarpa) | IX | Very light to light |
| Douglas-fir (P. menziesii) | III, IV | None |
| | XIII | None to very light |
| | V | None to light |
| | II, X | None to medium |
| | XI | None to heavy |
| | XII | Very light to very heavy |
| FIR: | | |
| Bristlecone fir (Abies bracteata) | XIII | None |

1/ Reported by technicians of the California Division of Forestry, the California Region of the U. S. Forest Service, the Pacific Southwest Forest and Range Experiment Station, Department of Forestry of Humboldt County, and the Southern California Edison Company.

| Species | Seed zone | Cone crop [1/] |
|---|---|---|
| California red fir (A. magnifica) | IV | None |
| | VII | None to heavy |
| | II | Very light |
| | I, III, X | Very light to light |
| | VIII | Very light to heavy |
| | V | Very light to very heavy |
| Lowland white fir (A. grandis) | XIII | Very light |
| | XII | Light to heavy |
| | XI | Heavy |
| White fir (A. concolor) | VI, VII | None |
| | II, IX | None to very light |
| | I, III, IV, V, VIII | None to light |
| | X | Very light to light |
| | XI | Light to medium |
| HEMLOCK: | | |
| Mountain hemlock (Tsuga mertensiana) | I, VII | None |
| | VIII | Very light |
| | V | Light |
| JUNIPER: | | |
| Western juniper (Juniperus occidentalis) | VI | None to very light |
| | VII | None to light |
| | I | Very light to light |
| | V | Light to medium |
| | VIII | Light to heavy |
| PINE: | | |
| Bishop pine (Pinus muricata) | XII | Very light |
| | XIII | Medium |
| Coulter pine (P. coulteri) | IX | Very light to light |
| | XIII | Light |
| Jeffrey pine (P. jeffreyi) | II | None to very light |
| | III, IX | None to light |
| | V | None to very heavy |
| | VII | Very light to light |
| | I, VIII | Very light to medium |
| | IV, VI | Very light to heavy |
| Knobcone pine (P. attenuata) | X, XI | Medium |
| | I, III | Heavy |

| Species | Seed zone | Cone crop [1] |
|---|---|---|
| Lodgepole pine (P. contorta) | I | None to very light |
| | III, V, VII, VIII | None to light |
| | XII | Very light |
| | XIII | Medium |
| Monterey pine (P. radiata) | XIII | Medium |
| Ponderosa pine (P. ponderosa) | VIII | None |
| | IX, XI | None to very light |
| | IV, V | None to light |
| | X | None to medium |
| | II, III | None to heavy |
| | XIII | Very light to light |
| | I | Very light to heavy |
| Singleleaf pine (P. monophylla) | VI | Very light |
| | VIII | Very light to light |
| Sugar pine (P. lambertiana) | II | None to light |
| | III | None to medium |
| | IV | None to very heavy |
| | I, VIII, IX | Very light |
| | VII | Very light to light |
| | X, XIII | Very light to medium |
| | XI | Light to medium |
| | V | Light to very heavy |
| Western white pine (P. monticola) | VI | None |
| | VII | None to light |
| | III | Very light |
| | I | Light |
| | V | Light to medium |
| | VIII | Medium |
| White bark pine (P. albicaulis) | VIII | None |
| SEQUOIA: | | |
| Giant sequoia (Sequoia gigantia) | V | Very light to light |
| | IV | Medium |
| Redwood (S. sempervirens) | XIII | Very light to medium |
| | XII | Very light to heavy |
| | XI | Medium |

Evaluation of 1958 Forecast:

Beginning with this report, a few notations will be made concerning the accuracy of the forecast for the preceding year in order to complete the record.

In general, the 1958 cone crop turned out about as predicted for most species and zones. The main exceptions were for Douglas-fir in zones X, XI, and XII (heavy losses due to insects); for ponderosa and Jeffrey pines in zones IV and V (losses due to squirrels and insects); and for sugar pine in zones II, III, IV, and V (losses due to squirrels and insects).

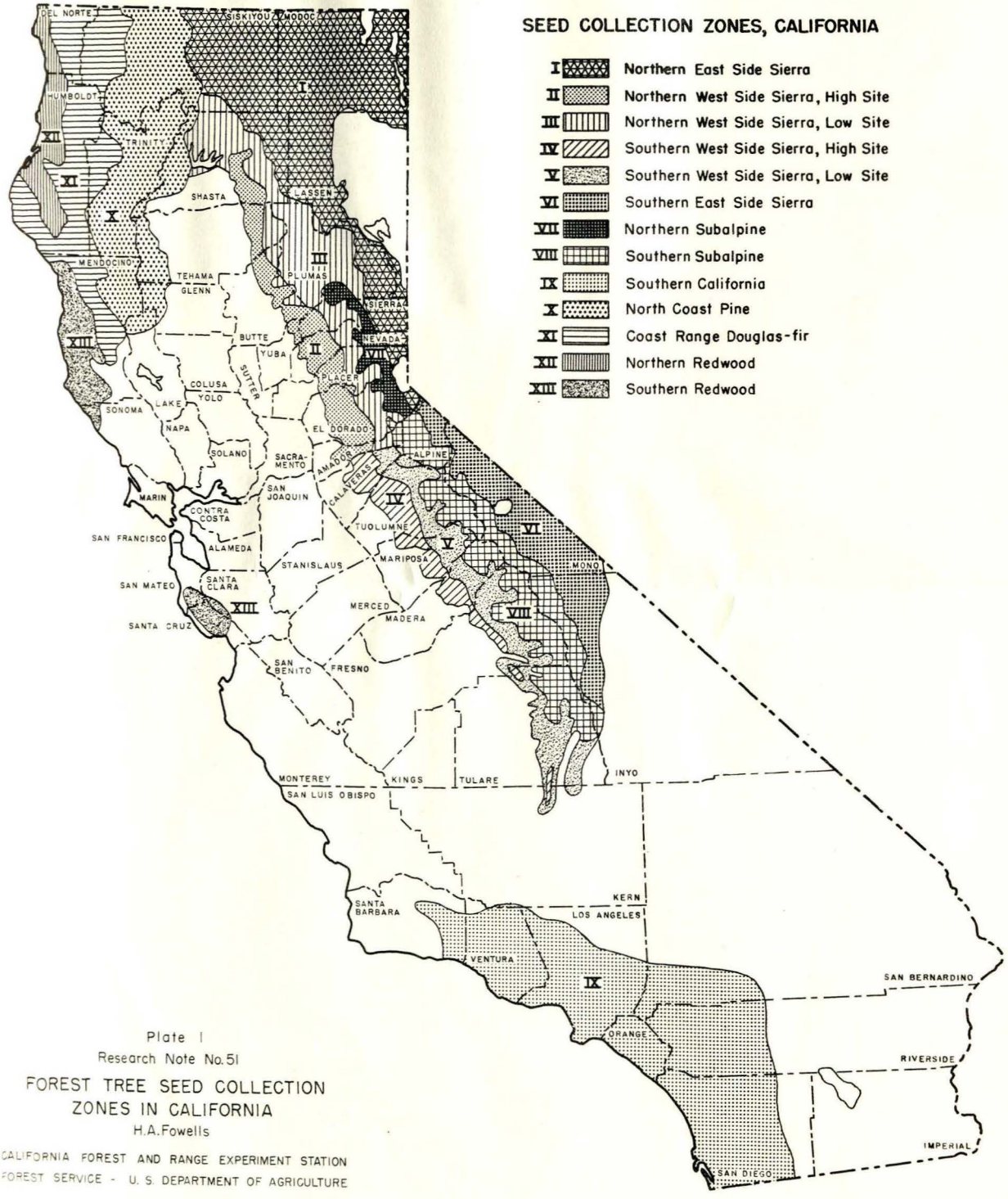


Plate I

Research Note No. 51

# FOREST TREE SEED COLLECTION ZONES IN CALIFORNIA

H.A. Fowells

CALIFORNIA FOREST AND RANGE EXPERIMENT STATION

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